

low, continued to recede. The rains that fell between the 9th and 15th resulted in rapid rises in the Sacramento River between Red Bluff and Sacramento city from the 19th to 21st and in the American, Feather, and Yuba Rivers between the 10th and 15th. By the 23d, however, a general fall was in progress. The warm rains that began on the 24th and which continued until the close of the month resulted in rapid rises in the Sacramento River south of Red Bluff between the 25th and the 31st. During the last three days of the month heavy warm rains fell in the Sierras from the headwaters of the American northward to the McCloud River country, melting large amounts of snow that had accumulated during the first three days of the storm and causing heavy freshets in all of the eastern tributaries of the Sacramento and high stages in the Sacramento itself between Colusa and Knights Landing.

On the 29th advisory messages were sent to the river observers at Colusa and Knights Landing advising that all new levees be patrolled during the next two days. This advice was also given to the official in charge of the north levee that protects the city of Sacramento from the American River.

The river rose rapidly between Colusa and Sacramento city during the 30th and 31st, and by midnight on the last-named date was at dangerously high stages at all points between the two places.

Considerable water escaped into Yolo Basin through an old break in the levee near the State Easement and from the overflow of Cache and Putah Creeks, and by the close of the month this basin was practically covered with water. There was also much backwater impounded in the American Basin.

*San Joaquin watershed.*—The rains that occurred in this watershed between the 9th and 15th of the month had little effect on the San Joaquin River itself south of the mouth of the Merced; elsewhere there was a general rise in all streams. Rain fell daily throughout the drainage basin of the San Joaquin Valley from the 24th to the end of the month, becoming torrential on the 30th and 31st, causing freshets in parts of the Calaveras River and in Mormon Slough on the 25th and unprecedentedly high water in the San Joaquin, Tuolumne, Calaveras, the lower Mokelumne and Cosumnes Rivers and in Mormon Slough between Bellota and Stockton. The most notable rise was that of the Tuolumne at Jacksonville, where the river rose over 20 feet in less than 24 hours.

Flood warnings were disseminated on the 30th to all sections of the lower Mokelumne and Cosumnes Rivers, on the Calaveras between Jenny Lind and Stockton, and on the San Joaquin between Stockton and Mendota, indicating the approach of a dangerous flood. By the evening of the 31st the water was rapidly spreading over a large area of country in the vicinity of the junction of the Mokelumne and Cosumnes Rivers and east and north of Stockton in the vicinity of Linden, and by midnight it has been estimated that 20,000 acres of land were overflowed. Emergency warnings were sent to the Chamber of Commerce at Stockton for dissemination, indicating grave danger to Stockton from backwater and to all sec-

tions contiguous to Lathrop and San Joaquin Bridge from the flood wave that was then moving rapidly down the San Joaquin River.

#### NOTES ON THE WEATHER OF THE MONTH AT FRESNO, CAL.

By W. E. BONNETT, Local Forecaster.

January was warmer than normal on every day except the first two, the departure being most marked from the 7th to 9th, 12th to 14th, and from the 28th to the 30th, both dates inclusive. The absolute minimum for the month occurred on the first day. A maximum of 72° was reached on the 8th, it being the highest temperature for this month in 24 years. The monthly mean temperature almost equaled that of January, 1896, and it is exceeded by but one other year, that of 1909. There were light frosts on the 3d, 4th, 5th, 6th, 7th, and 19th, heavy frosts on the 16th and 18th, and killing on the 1st, 2d, and 17th.

The drought that prevailed from September, 1910, was broken by moderate rains on the 9th, and the remainder of the month was very wet making this the wettest January of record save that of 1909, which by a peculiar coincidence was both the wettest and warmest January in the last 24 years at this station. The rainfall was heaviest on the 29th and 30th, but the ground was so dry from the drought of previous months that there was practically no run-off from the valley lands. However, the unusually high temperature caused rapid melting of the snows in the mountains, and streams were much swollen during the closing days of the month, getting out of their banks in places and doing some damage to bridges of wagon roads and railroads. No damage occurred in the immediate vicinity of Fresno, but there was some inconvenience due to disarrangement of train schedules and to accumulated water in parts of the city having poor drainage. Agriculturally the month has been very favorable and grain and grass are reported in excellent condition. The warm weather has advanced the fruit buds and blossoming will occur earlier than is usual.

The month was unusually free from foggy days, and the mean per cent of humidity for the month is the lowest of record, although this month was one of abnormally heavy rain. There was light fog on the 1st, 15th, 16th, 17th, 19th, and 22d and dense fog on the 1st, 15th, 17th, and 19th.

#### Precipitation in the mountains.

Stations.	January, 1909.	January, 1911.	Stations.	January, 1909.	January, 1911.
	Inches.	Inches.		Inches.	Inches.
Bear Valley (Nevada County).....	49.02	32.22	Fordyce Dam.....	55.53	30.72
Ben Lomond.....	42.57	38.44	Head Dam.....	41.03	38.43
Blue Canyon.....	48.35	33.02	Helen mine.....	71.54	29.69
Boulder Creek.....	39.42	33.95	Kennett.....	54.08	14.84
Branscomb.....	55.79	23.74	Laytonville.....	46.50	20.16
Brush Creek.....	46.39	33.12	Magalla.....	64.77	38.40
Camptonville (near)...	55.43	46.88	Mount St. Helena...	40.33	21.65
Deer Creek.....	56.32	41.77	Pilot Creek.....	50.25	39.52
Delta.....	53.28	16.70	Stirling City.....	51.63	32.55
Downieville.....	42.81	36.34	Upper Mattole.....	47.84	.....